Radial artery: A valuable arterial conduit for coronary artery bypass grafting with precise indications, contraindications and surgical strategy

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To the Editor

We read with interest the comparative review of Al-Sabti and colleagues between the radial artery (RA) and the saphenous vein as bypass grafts for coronary artery bypass grafting (CABG) [1]. We would like to add some remarks relating to the RA as arterial conduit for CABG.

In 1992, Acar and colleagues ''revived'' the RA after having observed that some RA grafts were, unexpectedly, still patent 14–18 years after the primary operation [2]. The earlier graft failure of the RA was attributed to spasm and intima hyperplasia [2]. Since the ''revival'' of the RA as coronary bypass graft, satisfying mid-term and long-term clinical results, in terms of survival rates and fewer cardiac events, have been reported [2,3]. Also, mid-term and long-term angiographical studies showed excellent patency rate of the RA bypass grafts, which are comparable with the patency rate of in situ mammary artery, and better than the patency rate of the mammary artery as free graft [2,3]. To achieve better high run-off condition, the target coronary artery receiving the RA grafts should have high grade stenosis (>70%) or be occluded, and supply viable myocardium in order to minimize the coronary resistance to graft flow and to overcome competitive flow phenomena with the native coronary arteries [2,3]. The RA, as a muscular graft, seems to lose its vascular tone and spasmogenic propensity progressively after its grafting [2].

We fully agree with Al-Sabti and colleagues that little information about both the effects of its harvesting and arm and hand circulation after the removal of the radial artery is available [1]. A justified concern about the risk of serious hand underperfusion, ischemia or neurological disabilities of the operated forearms is still present [1,2,4].

To investigate the long-term clinical consequences and outcome of removal of the RA on perfusion and functional status of the operated

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forearms, we conducted a clinical follow-up, which enrolled 42 patients who underwent CABG with RA between July 1997 and July 1998 [4]. These patients were submitted eight to nine years later to Doppler testing for assessment of systolic flow velocities, diameter and morphology of the ulnar artery of the operated forearms [4]. Our patient selection for CABG with RA was based on precise clinical criteria and careful preoperative assessment of adequacy of the ulnar collateral circulation [4]. Allen's test, Doppler study and pulse oximetry were routinely used [4]. Positive (pathologic test) Allen's test (>10 s), Raynaud's disease, Dupuytren's contracture, chronic renal insufficiency, vasculitis and advanced peripheral vascular disease were, in our experience, contraindications for RA harvesting [4].

Our results showed satisfying clinical functional status of the operated forearms [4]. Neither symptoms of ischemia (claudication and pain) nor functional disabilities were claimed [4]. Numbness of the thumb and slight hand tingling were reported [4]. The Doppler studies showed an increase in diameter and systolic flow velocities of the ulnar arteries of the operated forearms [4]. Neither calcifications nor significant increase in intima-media thickness index of the ulnar arteries secondary to the removal of the RA were documented [4]. Chronic compensatory mechanisms develop after the RA removal to readjust the hemodynamics and to offer an adequate blood supply to the operated forearms [4].

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